



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,680	02/13/2004	Nobuyuki Eto	Q79867	5870

23373 7590 11/01/2007  
SUGHRUE MION, PLLC  
2100 PENNSYLVANIA AVENUE, N.W.  
SUITE 800  
WASHINGTON, DC 20037

EXAMINER
----------

LAZORCIK, JASON L

ART UNIT	PAPER NUMBER
----------	--------------

1791

MAIL DATE	DELIVERY MODE
-----------	---------------

11/01/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/777,680	<b>Applicant(s)</b> ETO ET AL.	
	<b>Examiner</b> Jason L. Lazorcik	<b>Art Unit</b> 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4,6 and 7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6 and 7 is/are rejected.
- 7) ☒ Claim(s) 4 and 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

The request for a continued prosecution application (CPA) under 37 CFR 1.53(d) filed on [1] is acknowledged. 37 CFR 1.53(d)(1) was amended to provide that the CPA must be for a design patent and the prior application of the CPA must be a design application that is complete as defined by 37 CFR 1.51(b). See *Elimination of Continued Prosecution Application Practice as to Utility and Plant Patent Applications*, final rule, 68 Fed. Reg. 32376 (May 30, 2003), 1271 Off. Gaz. Pat. Office 143 (June 24, 2003). Since a CPA of this application is not permitted under 37 CFR 1.53(d)(1), the improper request for a CPA is being treated as a request for continued examination of this application under 37 CFR 1.114.

### ***Claim Objections***

Claims 4 and 7 are objected to because of the following informalities: Applicant has not appropriately annotated subject matter additions and/or deletions from the amended claim. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1791

**Claims 1 and 2** are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Aratani (US 4,671,814).

Aratani teaches a method for strengthening a glass substrate having a thickness of about 1.0mm by chemical strengthening. As set forth in Example 1 (Column 8, Lines 39-53), the immediate reference teaches that,

"The sample disks were immersed in a bath of molten sodium nitrate...The sample disks taken up from the bath were left to cool down and were washed with water to remove adherent sodium nitrate and dried.

After the above treatment with sodium nitrate, all the sample disks were immersed in a bath of molten potassium nitrate....The samples taken up from the molten potassium were left to cool down, washed and dried."

The Aratani disclosure clearly sets forth a two step process wherein a glass substrate is process with a first alkali ion of a first molten salt containing sodium nitrate and followed with a subsequent treatment using a second alkali ion of a second molten salt containing potassium nitrate. Applicant is advised that the claimed effect upon compressive stress at the surface of the substrate and tensile stress at an interior depth of the substrate are understood implicitly to follow from the disclosed process.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 1-3 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi (US 6,119,483) in view of Aratani (US 4,671,814). Briefly, Takahashi teaches a method for processing a glass substrate for use as a magnetic disk.

With respect to Claims 1 and 2, Takahashi teaches that the glass substrate used for manufacturing a magnetic disk, after completion of grinding, polishing, and washing steps is subjected to a chemical reinforcement step. According to this process, "the glass substrate which had been washed was heated in advance to 300°C, and immersed for about 3 hours in a chemical reinforcement solution preliminarily heated to 400°C, said solution having been prepared by mixing potassium nitrate (60%) and sodium nitrate (40%)". Further, the reference indicates that "When the glass substrate is immersed in the chemical reinforcement solution, lithium ions and sodium ions on the surface layer of the glass substrate are substituted by sodium ions and potassium ions in the chemical reinforcement solution, respectively, whereby the glass substrate is reinforced". (Column 10, Lines 50-67).

The immediate disclosure is understood to provide a method for processing a glass substrate for a magnetic disk wherein the glass substrate contains alkali ions

Art Unit: 1791

(lithium and sodium ions) on the surface layer of the glass substrate. The process using a first alkali ion (sodium) present as a molten salt of sodium nitrate and having a first ion radius greater than the smallest ion radius of the smallest alkali ion (lithium) among the alkali ions contained in the glass substrate. The process further uses a second alkali ion (potassium) present as a molten salt of potassium nitrate for supplying the second alkali ion.

With respect to Claim 3, the immediate reference teaches that an aluminosilicate glass to be used for chemical reinforcement contains as principle components 57 to 74%  $\text{SiO}_2$ ,... 3 to 15% of  $\text{Al}_2\text{O}_3$ , 7 to 16% of  $\text{Li}_2\text{O}$  and 4 to 14% of  $\text{Na}_2\text{O}$ , each in terms of mole percent" (Column 9, Lines 25-31). The reference continues with a preferred example of ~67%  $\text{SiO}_2$ , ~1%  $\text{ZnO}_2$ , ~9%  $\text{Al}_2\text{O}_3$ , ~12%  $\text{Li}_2\text{O}$  and ~10%  $\text{Na}_2\text{O}$ , each in terms of mole %. The cited example composition for the aluminosilicate glass reads directly upon the claimed concentration ranges for each constituent.

With respect to Claim 6, Takahashi indicates that "the magnetic disk is produced by forming a thin film such as a magnetic layer on a substrate and as the substrate for it,...(a) glass substrate has been employed" (Column 1, Lines 21-23)

Takahashi teaches that the treatment process as indicated above proceeds by a single dip in a molten solution or mixture of potassium nitrate (60%) and sodium nitrate (40%). As such Takahashi fails to explicitly set forth a scenario wherein the processing of the glass substrate is effected by the use of a first ion alkali ion and **subsequently** processing the substrate by the use of a second alkali ion. It is here understood that the disclosed immersion in a molten mixture or solution of the two alkali ions does not

Art Unit: 1791

anticipate the claimed process indicating a discrete first process step and a discrete ***subsequent*** second step.

Aratani teaches a method for strengthening a glass substrate having a thickness of about 1.0mm by chemical strengthening. As set forth in Example 1 (Column 8, Lines 39-53), the immediate reference teaches that,

“The sample disks were immersed in a bath of molten sodium nitrate...The sample disks taken up from the bath were left to cool down and were washed with water to remove adherent sodium nitrate and dried.

After the above treatment with sodium nitrate, all the sample disks were immersed in a bath of molten potassium nitrate....The samples taken up from the molten potassium were left to cool down, washed and dried.”

The Aratani disclosure clearly sets forth a two step process wherein a glass substrate is process with a first alkali ion of a first molten salt containing sodium nitrate and followed with a subsequent treatment using a second alkali ion of a second molten salt containing potassium nitrate. Aratani teaches that thin float glass substrates tend to severely warp during chemical tempering or strengthening and that “the principle cause of such warping is presumed to be diffusion of tin, or an alternate metal, used as the molten metal in the float process into the glass surface which is in contact with the surface of the molten metal bath” (column 1, Lines 61-68). The reference further indicates that the two step treatment “is remarkably effective for suppression of warping of float glass by ion exchange strengthening treatment” (Column 3, Lines 16-47). Since the Aratani process utilizes substantially the same materials in a substantially identical process, said two step process is implicitly understood to first “produce compression stress on a surface of the glass substrate and to produce tensile stress in a depth of the

Art Unit: 1791

glass substrate” and second to “increase the compression stress of the surface of the glass substrate and to reduce the tensile stress of the depth of the glass substrate” as claimed.

It would have therefore been obvious to one of ordinary skill in the art at the time of the invention to modify the single mixture (60% potassium nitrate/40% sodium nitrate) chemical strengthening process set forth by Takahashi with the two step process as taught by Aratani. This modification would have been obvious to one of ordinary skill seeking to minimize the degree and severity of warping in a planar float glass substrate incurred during the chemically strengthening process.

**Claims 4 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi (US 6,119,483) and Aratani (US 4,671,814) as applied to claim 1 above and in further view of Morehouse (US 5,379,171).

As set forth above, the collective prior art references teach every element of the Applicants parent claim 1. Specifically, Takahashi teaches that it is known to subject glass substrates of the claimed composition to a chemical strengthening operation when preparing a magnetic hard drive substrate. Aratani teaches that it is known to use Applicants claimed sequential, two-stage salt bath technique when chemically tempering a glass substrate in order to minimize deformation of the substrate. Takahashi teaches a specific embodiment wherein the glass disks have a thickness of 1.5 mm, and Aratani teaches substrates having a thickness of “about 1.0mm”.



As indicated in the previous Office Action, it is the Examiners position, in light of the Takahashi and Aratani disclosures, that the use of a substrate with a thickness of "0.2 to 0.9mm" or "0.2 to 0.6mm" represents a merely trivial and obvious extension the prior art of record. Specifically, Takahashi teaches the use of glass substrates having a thickness nearly equivalent to Applicants claimed thickness and Aratani teaches that the chemical tempering operation is applicable to substrates having a thickness of "about 1.0mm" thick. This point notwithstanding, neither of the cited references explicitly teaches the use of a glass substrate within the claimed thickness ranges.

The United States patent to Morehouse et. al. teaches the detailed construction of a magnetic hard drive device. With respect to the disk substrate, Morehouse teaches that (Column 43, lines 35-47);

"Magnetic recording disk 10 comprises a thin film surface, with coercivity greater than 1500 Oe, coated with materials such as Co--Ni or Co--Cr--Ta alloys, applied to both sides of a rigid substrate by methods such as RF sputtering or plating. The substrate used with magnetic recording disk 10 is preferably about 0.445 mm thick, with very flat, smooth, surfaces and with good mechanical rigidity. Examples of suitable substrate materials are aluminum alloys, glass and ceramic materials." (emphasis added)

As evidenced by the Morehouse reference, the use of a glass substrate having a thickness of 0.445mm which is in the range of 0.2 to 0.9 mm [Claim 4], or alternately

Art Unit: 1791

from 0.2 to 0.6mm thick [Claim 6], is known in the art of hard drive manufacture. In view of the instant disclosure, the use of a substrate of the claimed thickness would be considered obvious to one of ordinary skill in the art at the time of the invention.

### ***Response to Arguments***

Applicant's arguments filed August 2, 2007 have been fully considered but they are not persuasive.

Applicant asserts that the arguments set forth in the response dated February 12, 2007 were not directed against the references individually, but were intended to point out a lack of motivating factors that would lead one of ordinary skill in the art to combine the teachings of Takahashi with the teachings of Aratani. Specifically, Applicant asserts that neither prior art reference recognized Applicants particular motivation for carrying out a two stage chemical tempering operation. The primary advantage being namely an increased compression stress of the substrate surface and reduced tensile stress of the interior depth of the substrate.

The Examiner finds the instant arguments unpersuasive.

First, MPEP §2105 instructs that while "it is clear that while there must be motivation to make the claimed invention, there is no requirement that the prior art provide the same reason as the applicant to make the claimed invention." Specifically,

Art Unit: 1791

it would have been obvious to one of ordinary skill to use the two stage chemical tempering method taught by Aratani when seeking to minimize substrate warping in the chemical strengthening operation disclosed by Takahashi. Now, although the factors influencing one to combine the teachings presented in the Aratani and Takashi may differ from those set forth by Applicant, this difference alone does not detract from nor does it negate the validity of the Examiners motivation to combine the teachings. Further, Applicant has presented no convincing evidence that the combined prior art teachings will not yield a product with the claimed properties.

Next, Applicant argues that glass produced by the float glass process would "never" find utility in an application as a hard disk drive. The Examiner strongly disagrees. In response, Applicant is pointed to the United States patent to Wilson et. al (US 5,895,582) which teaches the fabrication of a magnetic data storage disk. Herein, the reference explicitly teaches (Column 2, line 63 to Column 3, line 12) the use of a float glass disk for application as the substrate in said magnetic recording media. The instant reference further teaches that such a float glass substrate after initial processing and shaping is subject to a chemical tempering operation similar to that discussed by the prior art of record (Column 3, lines 39-47). It follows that Applicants allegation that a process directed to the treatment of a float glass such as that disclosed by Aratani substrate would "never" be used in the fabrication of a magnetic disk substrate is wholly without merit.

Art Unit: 1791

Finally, Applicant is advised that the recent Supreme Court Decision in *KSR International Co. v. Teleflex Inc.* forecloses the argument that a specific teaching, suggestion, or motivation is required to support a finding of obviousness. See the recent Board decision *Ex parte Smith*, --USPQ2d--, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (Citing *KSR*, 82 USPQ2d at 1396)

### ***Conclusion***

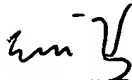
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1791

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JLL

  
ERIC HUG  
PRIMARY EXAMINER